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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,746	05/01/2001	Robert Bartola	257/267	6090

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EXAMINER

DATSKOVSKIY, MICHAEL V

ART UNIT	PAPER NUMBER
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2835

DATE MAILED: 07/25/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/847,746

Applicant(s)

BARTOLA ET AL.

Examiner

Michael Datskovsky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the transistor die comprising the surface forming the respective portion of the channel (claims 10 and 22) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 10 and 22 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Neither in the description nor in the drawings applicant has described or shown a transistor die mounted directly (without intermediate mounting flange) on a cooling channel. What was described and shown, as an electronic device is a structure comprising a transistor die attached to a mounting flange (page 9, lines 2-4).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 4, 6, 9, 11-15, 18, 21 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Hamilton et al (US Patent 5,763,951, further: "Hamilton et al 951"). Hamilton et al 951 teach a multi-layer printed circuit board (PCB), figs. 2-10, comprising: a plurality of mounting areas for attaching a plurality of heat producing devices - transistor dies 100 (152), and a coolant circulation channel 118 formed in a layer of the PCB by removal of portions of one or more layers of said PCB (etching-abstract, line 3), the channel having a portion in a vicinity of the mounting area, and a liquid coolant 116 circulating through said channel being forced by a pump 114 (154). Hamilton et al 951 teach furthermore: said channel includes a portion in thermal contact with a heat sink 110 (166).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 3, 5, 7, 8, 16, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al 951 in view of Little (US Patent 4,396,505, further: "Little 505").

Hamilton et al 951 teach all the limitations of the claims except a portion of said channel is formed by coinciding vias in located in adjacent layers of the PCB (claims 3, 16), the coolant is a gas (claims 5, 17), and said electronic device (transistor die attached to the flange) is mounted directly on the portion of the channel (claims 7, 8, 19 and 20). Little 505 teaches a multi-layer printed circuit board (PCB), figs. 1-23 comprising: a mounting area for attaching a heat producing device - semiconductor die 19, fig.16 and a liquid coolant circulation channel 23 formed in a layer of the PCB by coinciding vias in located in adjacent layers of the PCB 33, the channel having a portion in a vicinity of the mounting area, wherein said semiconductor die 19 is attached to a flange 71 which is mounted directly on the portion of the channel 23. It would have been obvious to one skilled in the art at the time invention was made to employ a portion of said channel formed by coinciding vias in located in adjacent layers of the PCB, a gas coolant, and an electronic device (transistor die attached to the flange) mounted directly on the portion of the channel, as it is disclosed by Little 505 in the device by Hamilton et al 951, in order to facilitate manufacturing of the device and enhance the dissipation of heat.

8. Claims 10 and 22 as best understood by examiner are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al 951 and Little 505 as applied to claims 7 and 19 above, and further in view of Hamilton et al (US Patent 5,801,442, further: "Hamilton et al 442").

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Hamilton et al 951 and Little 505 teach all the limitations of the claims except said transistor dies comprising the surface forming the respective portions of said channel (e. g. – being directly mounted on said channel). Hamilton et al 442 teach a multi-layer printed circuit board (PCB) 24', figs. 4-12, comprising: a mounting area for attaching a heat producing device - transistor die 20, and a coolant circulation channel 62,64 formed in a layer of the PCB 24', the channel having a portion in a vicinity of the mounting area, and a liquid coolant circulating through said channel, wherein said channel includes a portion in thermal contact with a heat sink 68', and said transistor die 20 comprises the surface forming the respective portions of said channel 62, 64 (e. g. – being directly mounted on said channel). It would have been obvious to one skilled in the art at the time invention was made to employ a transistor die comprising the surface forming the respective portion of said channel (e. g. – being directly mounted on said channel, as it is disclosed by Hamilton et al 442 in the device by Hamilton et al 951 and Little 505 in order to enhance the dissipation of heat.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Ullman et al (US Patent 5,903,583); Martin (US Patent 5,313,361); Little (US Patent 4,392,362); Schutz-Harder (US Patent 6,345,665); Tsukada et al (US Patent 5,575,872); Reisman et al (US Patent 4,774,630); Bezama et al (US Patent 5,870,823); Yamamoto et al (US Patent 5,785,754); Singhdeo (US Patent 4,739,443); Seibold et al (US Patent 5,142,441); Fuesser et al (US Patent 6,101,715); Wolgemuth et al (US Patent 5,453,911); Bartilson (US Patent 5,166,775); Snyder et al (US Patent 6,418,019); Sullay et al (European Patent EP0844808A2); Danhke (German

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Patent DE19711533A1); Baba (Japan Patent JP02001168563A) and Kawano et al (Japan Patent JP406326226A), most of them are being applicable for the rejection of the at least claims 1 and 12 of the instant application.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Datskovsky whose telephone number is (703) 306-4535. The examiner can normally be reached on Mn - Fry 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren E. Schuberg can be reached on (703) 308-4815. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Patent Examiner

Michael Datskovsky 

July 12, 2002